Quality Assurance Audit Report

Technical Systems Audit
PacifiCorp Dave Johnston Power Plant

Air Quality Program

July 9-11, 2018

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1. Executive Summary

This report presents the results of the July 9-11, 2018 Technical Systems Audit (TSA) of the PacifiCorp Dave Johnston Power Plant (DJPP) ambient air monitoring program for sulfur dioxide (SO_2) conducted by the United States Environmental Protection Agency (EPA) Region 8 in July 2018. Title 40 Code of Federal Regulations (CFR), part 58, appendix A, section 2.5 requires TSAs of primary quality assurance organizations (PQAOs) to be performed at least once every three years by the appropriate EPA Regional Office. The Sulfur Dioxide Data Requirements Rule (SO_2 DRR) was promulgated in August 2015 to provide air agencies ambient air SO_2 concentration data for unclassified areas associated with large sources of SO_2 emissions. The DJPP ambient air monitoring program for SO_2 was required to become operational by January 1, 2017. The DJPP SO_2 monitoring station began collecting data officially on November 2, 2016 and was reporting data to Air Quality System (AQS) on January 1, 2017. This was the first TSA performed by EPA Region 8 on the DJPP ambient air monitoring program for SO_2.

The purpose of the TSA is to assess the DJPP's ambient air monitoring program to determine its compliance with established regulations and guidance governing the collection, analysis, validation and reporting of ambient air quality data. The assessment was accomplished through the review of a pre-audit questionnaire, the review of quality system documents, interviews with DJPP personnel and their contractor Meteorological Solutions Inc. (MSI) Trinity, observations of data and records, and on-site inspections of monitoring equipment at the monitoring site.

The November 2017 EPA Quality Assurance Guidance Document on TSAs[1] recommends that audit findings be ranked into four categories or tiers: Major Findings, Minor Findings, Concerns, and Observations. Observations are items identified during the TSA which do not violate any established guidance or regulation, but for which the auditor noted a potential for improvement. Concerns are identified practices that can potentially result in a detrimental effect on the ambient air monitoring program's operational effectiveness or the quality of sampling or measurement results. Minor findings are items identified during the TSA which violate established guidance, regulation, or best practice, but are not currently affecting the validity of ambient air data. Major findings are items identified during the TSA which may affect the validity of ambient air data submitted to Air Quality System (AQS).

No major findings were identified during the DJPP TSA. Minor findings noted included: a limited number of required equipment maintenance activities specified in the DJPP SO_2 QMP/QAPP were not performed as scheduled; the monitoring project reports were not distributed to the EPA Region 8 contact listed on the distribution list in the DJPP SO_2 QMP/QAPP; the shelter temperature device for monitoring the interior temperature of the monitor shelter had not been checked by a NIST – traceable standard; and, it was not evident that the daily calculation of standard deviation of shelter temperature over 24 hours was performed. Other issues noted in the audit did not rise to the level of audit findings but are included in section 7 of this report as "Concerns" and "Observations."

[1] Quality Assurance Guidance Document, *Conducting Technical Systems Audits of Ambient Air Monitoring Programs*, EPA-454/B-17-004, November 2017.

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2. Introduction

A TSA is an on-site review and inspection of a monitoring organization's ambient air monitoring program to assess its compliance with established regulations and guidance governing the collection, analysis, validation, and reporting of ambient air quality data. A TSA is also an opportunity to highlight areas within a monitoring agency where it has shown innovation and improvement, to identify areas where programs can be strengthened, and to provide feedback to the agency.

TSAs are required under 40 CFR 58, appendix A, section 2.5 which states:

> Technical systems audits of each PQAO shall be conducted at least every 3 years by the appropriate EPA Regional Office and reported to the AQS. If a PQAO is made up of more than one monitoring organization, all monitoring organizations in the PQAO should be audited within 6 years (two TSA cycles of the PQAO). As an example, if a state has five local monitoring organizations that are consolidated under one PQAO, all five local monitoring organizations should receive a technical systems audit within a 6-year period. Systems audit programs are described in reference 10 of this appendix.

The DJPP operates as an independent PQAO and is therefore to be audited once every three years. This was the first TSA performed by the EPA at the DJPP.

The EPA Region 8 auditing team was Albion Carlson (the TSA lead) and Ethan Brown. Dan Sharon from the Wyoming Department of Environmental Quality's Air Quality Division (AQD) also participated in the audit. To initiate the 2018 DJPP TSA, Albion Carlson sent an introductory email and TSA Questionnaire to Anne Saul, DJPP compliance manager and facility coordinator, on March 29, 2018. The completed questionnaire was returned to the EPA on May 3, 2018. A preliminary TSA schedule was drafted and sent to Anne Saul on June 21, 2018. The on-site portion of the TSA began on July 9, 2018 and was completed on July 11, 2018. A draft TSA report was supplied to the DJPP for review and comment on the accuracy of the content prior to finalizing this report.

PacifiCorp hired MSI Trinity, a Salt Lake City, Utah based contactor, to install, operate, and maintain the DJPP SO_2 monitor. MSI Trinity maintains much of the project documentation, off-site equipment and quality assurance (QA) equipment. Therefore, MSI Trinity was included in the TSA communications, and participated in the audit.

The on-site portion of the TSA began on July 9, 2018 and was completed on July 11, 2018. During the on-site TSA, the Region 8 auditors interviewed PacifiCorp and MSI Trinity personnel in the DJPP facility office and during the SO_2 monitoring site inspection

The following PacifiCorp and MSI Trinity personnel were interviewed on-site:

Anne Saul, Facility Coordinator and Compliance Manager, PacifiCorp
Alan Dugan, Engineering Manager, PacifiCorp
Craig Lucke, Senior Engineer, Salt Lake City Office, PacifiCorp
Isaac Legare, Field Technician, MSI Trinity

Scott Adamson, QA Managing Consultant, MSI Trinity
Brian Olsen, Data Manager, MSI Trinity

Scott Adamson and Brian Olsen participated in the on-site interviews via teleconference from their MSI Trinity offices in Salt Lake City.

While at the monitoring station, the auditors inspected the shelter and surrounding area as well as the air quality instruments, analyzers, documents, records and data. Craig Lucke, Anne Saul and Isaac Legare accompanied the auditors to the monitoring site.

3. Laboratory

The DJPP SO_2 monitoring program does not require a weighing lab or an analytical air lab.

4. Facilities

The DJPP maintains general office space both at the power plant and at PacifiCorp corporate offices in Salt Lake City, Utah where the data certifications and quality assurance reports are developed. The entrance and exit interviews for the TSA were conducted in a meeting room at the power plant where the offices of the Facility Coordinator and other local DJPP personnel are also located.

The other facility associated with the DJPP SO_2 monitoring program is the MSI office located in Salt Lake City, Utah. In addition to data storage, instrument repairs and certification of standards, data verification and processing are conducted at this facility.

5. Data and Records

Records are primarily stored on-site in the shelter, at the MSI office, and on MSI computer servers. A summary of project documentation and reports are presented in Table C-1 of the DJPP SO_2 QMP/QAPP.

6. Site Visit (All Figures in Appendix A)

The SO_2 monitoring station operated to satisfy the requirements of the DRR (Figure 1) is located on state land approximately 4.3 miles southwest of the DJPP near Glenrock, Wyoming. The monitoring site location was selected for characterizing maximum 1-hour SO_2 impacts from the power plant and was approved by both the Wyoming AQD and EPA Region 8. The power plant is visible from the monitoring site (Figure 2).

The monitoring station was first evaluated from outside the shelter for any issues that might restrict or affect airflow to the sample inlet and it was determined there were no obstacles to airflow or issues with the placement of the sample inlet probe (Figure 3). The sample inlet was clean (Figure 4) and the shelter's condition was very good.

Inside the shelter, the T100 SO_2 monitor (Figure 5), data logger (Figure 6), calibrator (Figure 7), and zero air generator (Figure 8), were all confirmed to be those identified in the quality system documents and AQS. The shelter interior was organized and clean (Figure 9). Calibration gas kept inside the station had an adequate tank pressure and certification date (Figures 10, 11 and

12). The hard copy logbook (Figure 13) had an initial entry dated June 29, 2017 (Figure 14) and was found to have several station entries unsigned. Both DJPP and MSI personnel made entries in the hard copy logbook but only MSI personnel have access to the electronic (One-Note) logbook (Figure 15) which was found to have a complete record of MSI personnel activities at the monitoring station from the time operations began.

The general layout of the monitoring equipment and associated gas lines (Figure 16) was properly configured and in good working order.

7. Findings and Recommendations

The DJPP and MSI run a successful SO_2 Ambient Air Monitoring Program. The personnel interviewed during the TSA were very experienced and knowledgeable about air quality monitoring and the DJPP SO_2 Monitoring Program. It is evident that an effective system is in place to ensure required tasks are completed, project employees are well trained, and project records are well kept. The EPA recognizes the commitment and efforts to collect good quality SO_2 data.

At the TSA exit interview held July 11, 2018, the lead auditor provided preliminary findings and discussed potential corrective actions with the DJPP and MSI. On August 11, 2018, the auditors were copied on a station maintenance update sent by Isaac Legare with MSI to Anne Saul with the DJPP which demonstrated several corrective actions were already underway.

Discussed in Table 1. below are a list of the findings and recommendations from the TSA. Major findings are those which, if uncorrected, have the potential to lead to instances where collected data might be inaccurate or invalidated after problem detection and investigation. No major findings were identified in this audit. Several other issues, termed minor findings, concerns and observations, were identified.

Table 1. List of Findings and Recommendations

Major Findings
No Major Findings
Minor Findings
1) A limited number of required equipment maintenance activities specified in the DJPP SO_2 QMP/QAPP were not performed as scheduled. Based on the auditors' review of the station logs and interviews with MSI personnel it was determined that: 1) the particulate filter replacement on the T100 SO_2 analyzer was not performed quarterly (Table B-9 of the QMP/QAPP); 2) the activated charcoal replacement for air filtration for the T701 zero air supply was not performed every 6 months (Table B-9 of the QMP/QAPP); and 3) the sample inlet tubing had not been replaced annually (Table B-8 of the QMP/QAPP). Based on log entries reviewed and discussion with MSI personnel it appeared that the particulate filter replacement on the T100 SO_2 analyzer had only been performed once (on June 26, 2018) since operation began. It also appeared that neither the activated charcoal replacement for air filtration for the T701 zero air supply or the sample inlet tubing replacement had been performed since operation began.

Recommendation: The required equipment maintenance activities should be performed as specified in the DJPP SO_2 QMP/QAPP. The schedules in the QMP/QAPP are consistent with guidance found in the EPA QA Handbook for ambient air monitoring.[2] The operation manuals for the T100 and T701contain manufacturers recommendations that are consistent with or even more frequent than filter replacements specified in the QMP/QAPP.

2) **The monitoring project reports (audit reports, quarterly data summaries, corrective action reports, and response to corrective action reports) were not distributed to Josh Rickard, the EPA Region 8 SO_2 monitoring contact listed on the distribution list in the DJPP SO_2 QMP/QAPP.** The EPA auditors were provided some of these reports prior to the TSA by the Wyoming DAQ upon request.
Recommendation: In order to meet reporting requirements and maintain good communication with all parties involved, the monitoring project reports should be distributed to everyone listed on the distribution list located in the DJPP SO_2 QMP/QAPP.

3) **The shelter temperature device for monitoring the interior temperature of the monitor shelter had not been checked by a NIST–traceable standard as recommended in the EPA QA Handbook[2] for ambient air monitoring at Section 7.2.2. It was also not evident that the daily calculation of standard deviation (SD) over 24 hours was performed as a check to be sure the SD did not exceed the 2 degrees centigrade limit.** The shelter temperature device is located in the datalogger and is therefore not conducive to a standard water bath device check. The shelter temperature device check is to be performed every 180 days. The SD check for shelter temperature fluctuations is to be done daily.
Recommendation: To meet the requirement outlined in the operational criteria of the SO_2 Validation template in the EPA QA Handbook the shelter temperature device check should be performed every 6 months using a NIST–traceable standard. The SD check for shelter temperature fluctuations should be done daily and documented as procedure.

Concerns

1) **It was noted that the organizational chart found in the DJPP SO_2 QMP/QAPP and provided in response to the TSA Questionnaire was not accurate and up to date with respect to MSI personnel duties. It appeared independence of data collection activities from data quality assurance activities could be lacking due to personnel and role changes.** George Wilkerson (Project Director) left the project a couple months before the TSA and Casey Lenhart (Project Manager) had assumed his duties. Consequently, Scott Adamson (who performs quality assurance) is supervised by Casey Lenhart who also supervises the field technicians and Brian Olsen (the data manager). To maintain necessary independence between data collection and data quality assurance

[2] Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Quality Monitoring Program, section 7.2.2 Sampling Environment, January 2017.

activities,[3,4] it is anticipated Casey Lenhart will soon be named the Project Director and Isaac Legare (field technician) will be named the Project Manager. Also, it was noted that two new field technicians had been assigned in recent months to replace those who had left or been reassigned. The current organizational chart did not reflect these changes.
Recommendation: DJPP/MSI should expedite project personnel moves and update the organization chart in the QMP/QAPP accordingly.

2) **The hard copy logbook located with the SO_2 monitoring station had no entries detailing site visits prior to the first entry dated June 17, 2017.** Based on review of electronic logbook entries and discussion with MSI personnel it appeared there was no hard copy station logbook on site prior to the first entry. Often DJPP personnel assist MSI with troubleshooting operations (they are available on site) and both DJPP and MSI entries are recorded in the hard copy logbook. Because DJPP personnel do not have access to the electronic logbook (One-Note) used by MSI, it is necessary to have both a hard copy and an electronic logbook. Not all entries made in the hard copy logbook were signed
Recommendation: Ensure all personnel active on the monitoring site have the means to record logbook entries and that all entries are signed.

Observations

1. **It was noted that the corrective action reports from September of 2017 were not summarized in the quarterly data summary.** Corrective action reports should be included or summarized in the quarterly data summaries in order to explain associated data anomalies.

2. **It was observed that one carbon copy of a site visit entry had not been retrieved from the hard copy logbook**. Carbon copies of site visit entries should be retrieved per the QMP/QAPP.

[3] Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Quality Monitoring Program, section 15.2.1 National Performance Audit Program, Figure 15.1 Definition of independent assessment, January 2017.
[4] 40 CFR Part 58 Appendix A Sections 2.2 and 3.1.2.

Appendix A: Figures

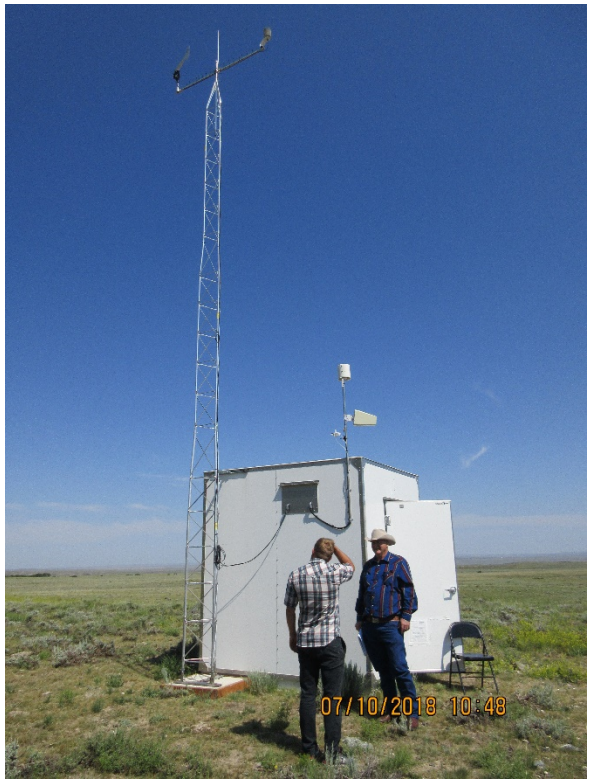

Figure 1. Dave Johnson Power Plant SO_2 Monitoring Station

Figure 2. View of the Dave Johnston Power Plant from the Monitoring Station

Figure 3. Sample Inlet Probe Mast

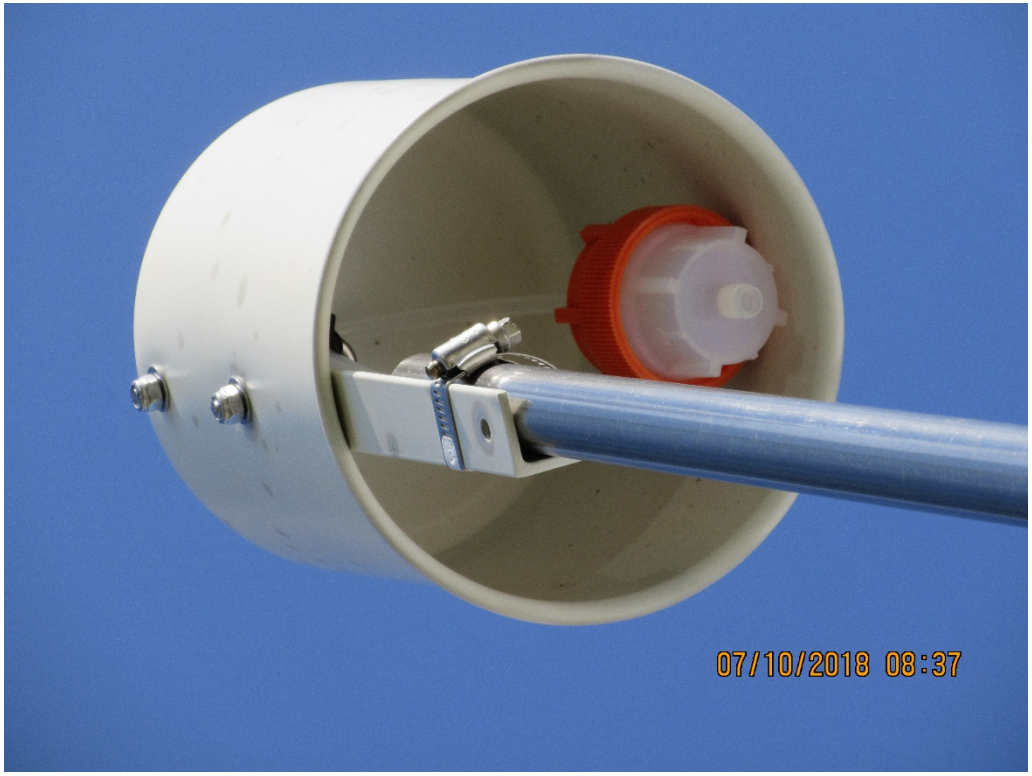

Figure 4. Sample Inlet

Figure 5. Teledyne T100 SO_2 Analyzer

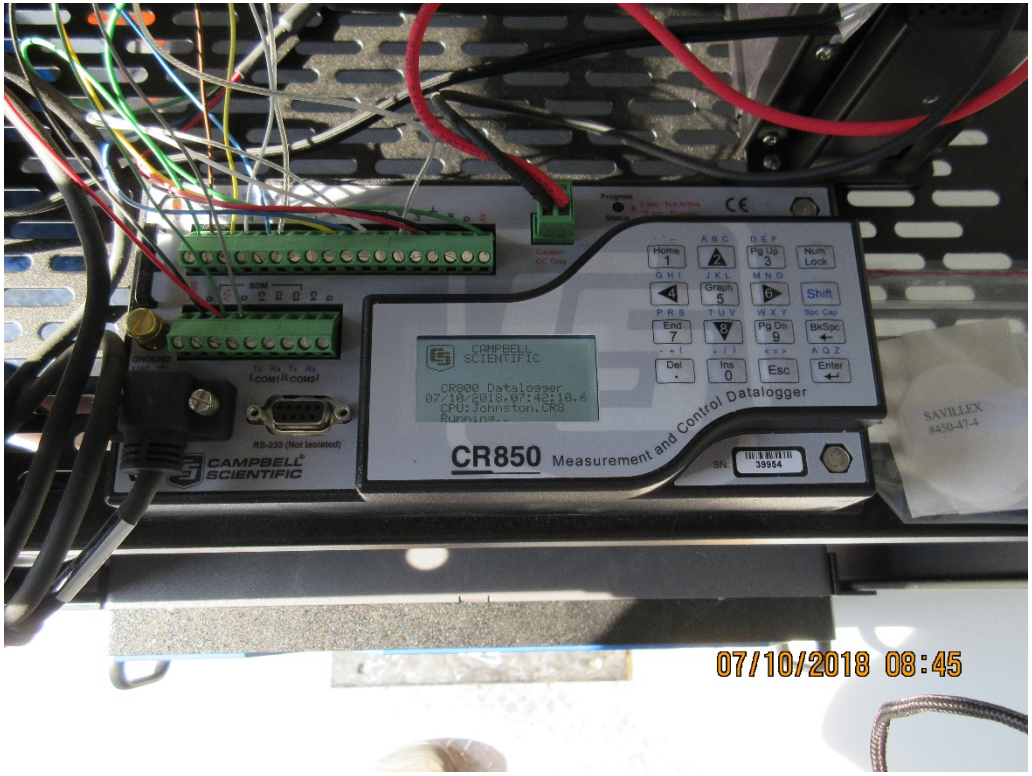

Figure 6. Campbell Scientific Inc. Model CR850 Data Logger

Figure 7. Teledyne T700 Dilution Calibrator

Figure 8. Teledyne T701 Zero Air Generator

Figure 9. Monitoring Shelter Interior

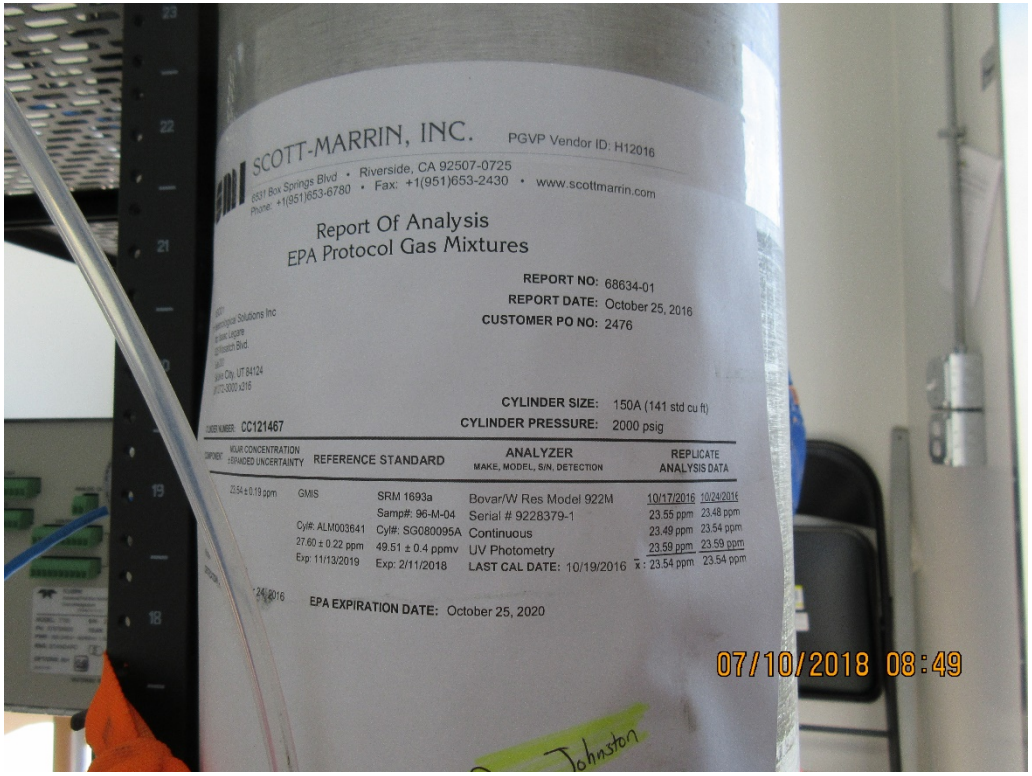

Figure 10. Calibration Gas Cylinder

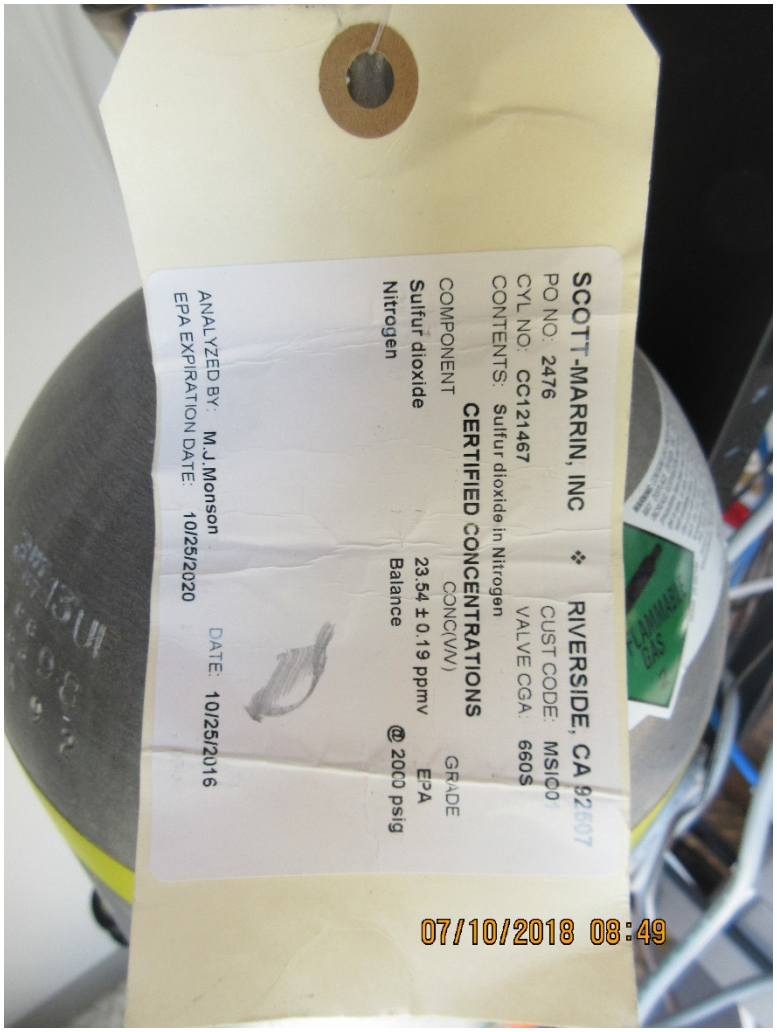

Figure 11. Calibration Gas Certification

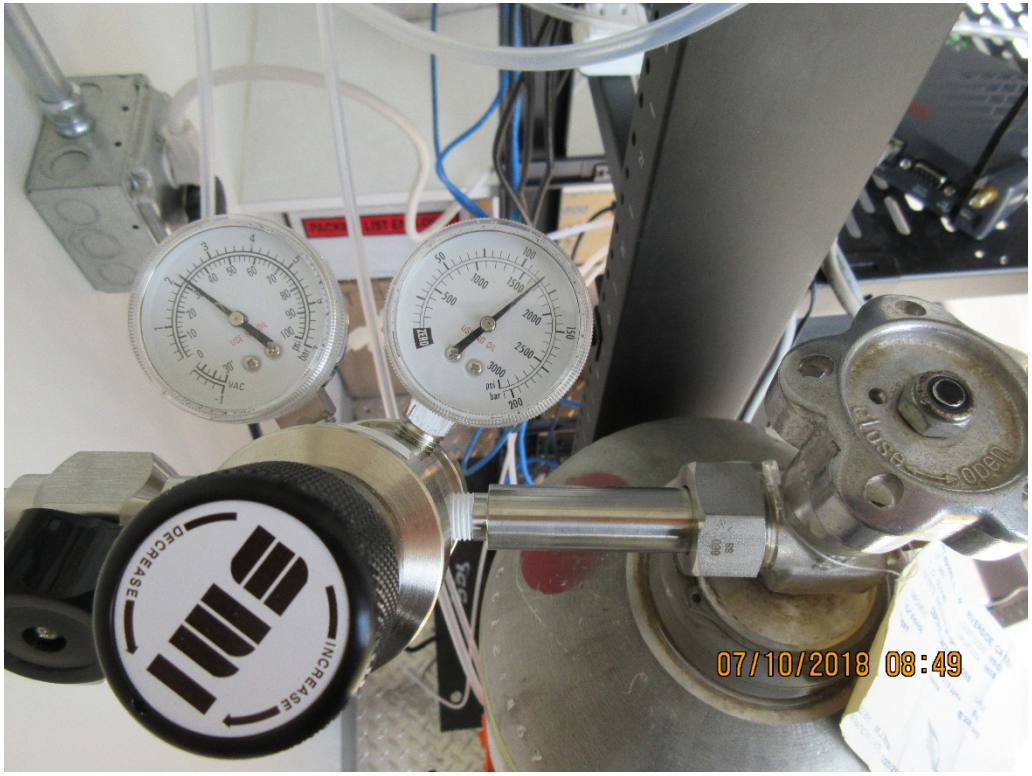

Figure 12. Cylinder Regulator

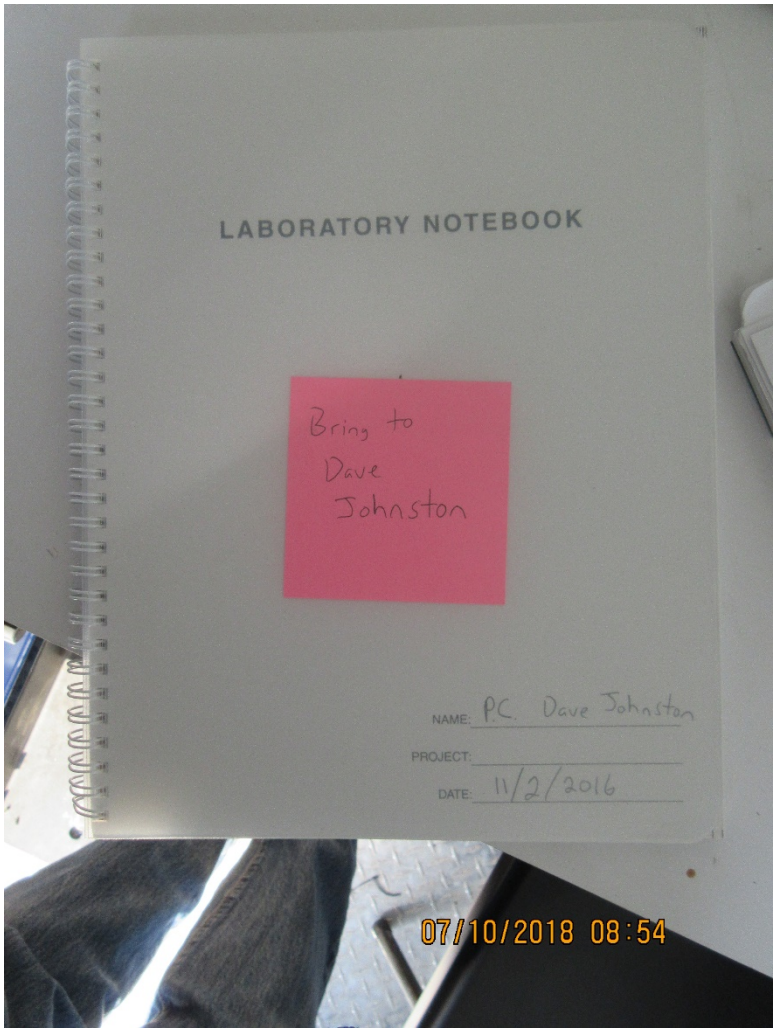

Figure 13. Station Hard Copy Logbook

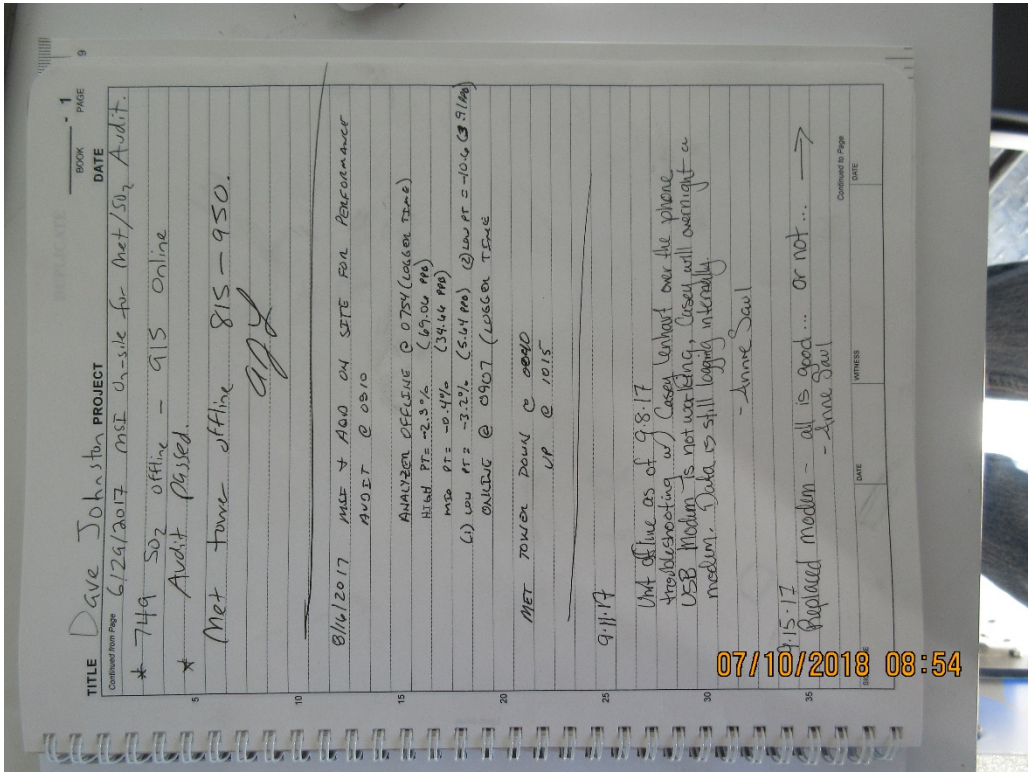

Figure 14. First Page of Hard Copy Logbook

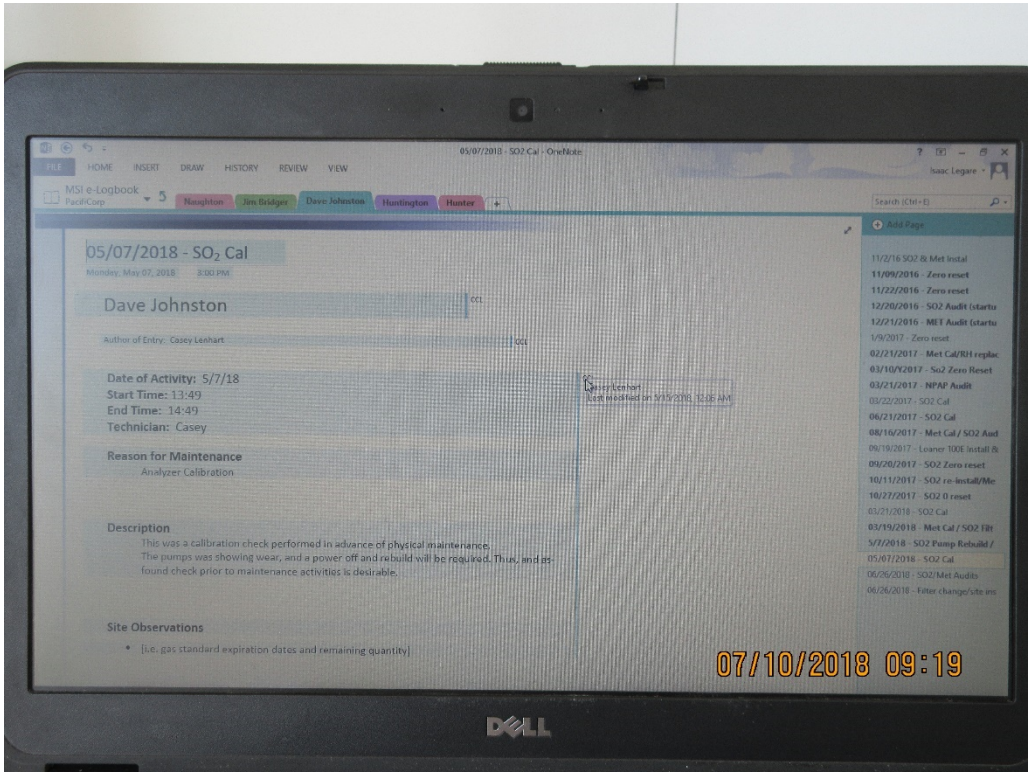

Figure 15. Electronic Station Logbook - One Note

Figure 16. General Configuration of Monitoring Equipment and Gas Lines (View from the Back)

Appendix B: PacifiCorp Dave Johnston Power Plant TSA Questionnaire